

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Edward Grolz on February, 19, 2008.

The specification has been amended as follows:

"Spezyme CE and GC 440" on page 8 ¶1, line 12 now reads "'SPEZYME[®] CE and GC 440".

"cellulose GC440" on page 17, line 3 now reads "GC 440 cellulase".

"Rohalase[®]Sep" on page 9, lines 2 and 7 and on page 20 line 9 now reads "ROHALASE[®] SEP".

"Rohalse[®] SEP" and "Rohalase[®] SEP" in table 3, page 20 now read "ROHALASE[®] SEP".

The claims have been amended as follows:

1. A method of extracting β -amylase from a cereal, the method comprising:

- (a) providing a composition comprising a cereal in an aqueous medium, wherein the cereal is an ungerminated cereal grain selected from the group consisting of barley, wheat, and rye;
- (b) extracting the composition of step (a) in the presence of an enzyme preparation to obtain an extract containing β -amylase, wherein the enzyme preparation comprises cellulase, hemicellulase, and β -glucanase activities in the aqueous medium; and, then
- (c) recovering β -amylase in purified form from the extract of step (b).

Art Unit: 1651

2. (Cancelled)

3. The method of claim 1, wherein the cereal is barley or wheat.

4. The method of claim 1, wherein the cereal further comprises pretreated grains of said cereal and wherein said pretreated grains are pretreated by a process selected from the group consisting of removing of husk, bran, starch, or gluten; milling; grinding; polishing; and combinations thereof.

5. The method of claim 4, wherein the cereal is barley, wherein the pretreated grains of the cereal comprises a husked barley, and wherein the husked barley is provided by removing of husk from a grain of said barley.

6. The method of claim 5, wherein the husked barley further comprises a husked barley having a substantially intact endosperm.

7. The method of claim 6, wherein in the process of removing of husk from the cereal no more than 20% of the weight of the barley cereal is removed.

8. The method of claim 1, wherein the extracting is carried out in reducing conditions, and wherein said reducing conditions are capable of releasing β -amylase bound to structural protein of the cereal.

9. (Cancelled)

10. The method of claim 8, wherein said reducing conditions are provided by water containing SO_2 .

11. The method of claim 5, wherein said husked barley is extracted with an aqueous medium comprising water and SO_2 and wherein the ratio of husked barley to aqueous medium is from 5:8 to 2:3 (w/v).

Art Unit: 1651

12. The method of claim 1, wherein in step (b) extracting is carried out at a temperature of 25 to 35°C.

13. The method of claim 12, wherein said temperature is 29 to 31°C.

14. The method of claim 1, wherein said extracting comprises extracting for 48 to 66 hours.

15. The method of claim 14, wherein said extracting comprises extracting for 55 to 62 hours.

16. (Cancelled)

17. The method of claim 1, wherein in step (b) extracting in the presence of an enzyme preparation comprises adding an enzyme preparation to the composition of step (a) at a concentration of enzyme versus cereal of at least 0.015% by weight (w/w).

18. The method of claim 17, wherein adding said enzyme preparation to said composition of step (a) comprises adding the enzyme preparation at a concentration corresponding to an enzyme activity selected from the group comprising:

(i) at least 1050 Units (U) of dinitrosalicylic acid carboxymethyl cellulose (DNS-CMC) cellulase activity per kilogram of cereal;

(ii) at least 900 U of β -glucanase activity per kilogram of cereal; and,

(iii) at least 285 U of dinitrosalicylic acid xylanase (DNS-xylanase) activity per kilogram of cereal; and,

wherein the enzyme preparation is the cellulase enzyme GC 440 obtained from *Trichoderma longibrachiatum*.

19. The method of claim 1, wherein said enzyme preparation comprises a cellulase of a mold.

20. The method of claim 19, wherein said mold is a mold selected from the group consisting of the genera *Humicola*, *Fusarium*, *Myceliophthora*, *Aspergillus*, *Penicillium*, *Trichoderma*, and

combinations thereof.

21. The method of claim 19, wherein said cellulase is a cellulase of *Trichoderma* mold.

22. The method of claim 1, further comprising the step of producing starch from said cereal.

23. The method of claim 22, wherein said β -amylase is extracted from the composition of step (a) before separating starch from said cereal.

24. The method of claim 22, wherein said β -amylase is extracted from the composition of step (a) after separating starch from said cereal.

25. The method of claim 1, wherein said enzyme preparation increases the yield of β -amylase obtainable from said cereal.

26. The method of claim 25, wherein the yield of β -amylase is between about 10 and 15% higher than without said cellulase present.

27. The method of claim 1, wherein said recovering β -amylase from said medium comprises removing β -amylase from said medium in purified and concentrated form by pressure filtration and ultra filtration.

28. A method of extracting β -amylase from barley, comprising the steps of:

- a) providing an aqueous medium containing grains of barley in ungerminated form;
- b) providing a cellulase enzyme preparation having at least cellulase, hemicellulase, and β -glucanase activities in said aqueous medium;
- c) extracting β -amylase from said grains to provide an aqueous extract containing β -amylase;
- d) recovering β -amylase in purified form from said aqueous extract; and

Art Unit: 1651

e) optionally subjecting said recovered β -amylase of step (d) to further processing, said processing selected from purifying, concentrating, and combinations thereof.

29. The method of claim 28, wherein the β -amylase yield is as much as 65% of the total amount of β -amylase in said barley.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AARON J. KOSAR whose telephone number is (571)270-3054. The examiner can normally be reached on Monday-Thursday, 7:30AM-5:00PM, ALT. Friday,EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ak/

/Sandra Saucier/
Primary Examiner, Art Unit 1651

Aaron Kosar
Examiner, Art Unit 1651